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ENVIRONMENTALLY PREFERABLE PURCHASING: WHO IS DOING WHAT IN THE UNITED STATES?

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ABSTRACT. In recent years, concerns over environmental degradation and environmental sustainability have pushed governments to search for new ways to combat environmental problems. One such approach, which is gaining in popularity, is environmentally preferable purchasing (EPP). EPP attempts to address environmental challenges by taking advantage of government's vast purchasing power to create strong markets for environmentally friendly products and services. This article reviews governments' experience with EPP in the United States. Specifically, the article describes the development of EPP in the federal government and reviews EPP activities at both the national and subnational levels. Next, the article presents several broad strategies that governments and procurement professionals can pursue in implementing EPP. The article concludes by identifying several challenges facing EPP.

INTRODUCTION

Procurement is a government function to purchase the goods and services needed to run the government and provide government services. Because all local, state and federal governments must obtain goods and services, procurement is an important function of government. A governmental entity can approach procurement and provision of service in two ways. It can buy the materials it needs from a vendor and then

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use its own personnel to provide the service; or can enter into a contract with a second party provider for the needed service. The second party might be another unit of government, a nonprofit organization, or a for-profit firm that will provide both the materials and the service.

The more than sixty federal government agencies, employing more than 1.7 million civilian workers, acquire most of their goods and services through contracts. For instance, in 2001 the federal government spent more than $235 billion in goods and services contracts or nearly one-quarter of its discretionary resources (Government Accountability Office [GAO], 2003a). State and local governments independently spent another $385 billion for contracted goods and services in 2000 (Cooper, 2003; Environment Protection Agency [EPA], 2000a). All units of government considered together, therefore, spend more than a half a trillion dollars annually on procurement. The amount of money spent by the government on goods and services has been increasing rapidly. The amount spent in 2001 showed an 11 percent increase over the amount spent 5 years earlier (GAO, 2003a). The downsizing of the federal government has been accompanied by an increase in the number of service contracts and an increasing number of high-dollar procurement actions (GAO, 2003b). These trends make scrutiny of procurement practices of high importance.

WHAT IS ENVIRONMENTALLY PREFERABLE PURCHASING?

Environmentally preferable purchasing (EPP) generally refers to including "green" or "environmentally friendly" practices in government procurement processes. When governments buy products from vendors or when governments use second party providers to deliver services, adherence to EPP practices would suggest spending taxpayer dollars in an environmentally friendly way. The large government expenditure on goods and services provides a unique policy tool, if government units decide to use their purchasing power to achieve policy ends (Thai, 2001; McCue & Gianakis, 2001). In the case of EPP, the policy end is a cleaner environment. Reaching this goal requires that units of government target their spending so that strong markets are created for products that are recycled, use reduced raw materials, are energy efficient, and are non-toxic. The power of half a trillion purchasing dollars annually can have enormous impact on market creation and strength. The federal, state, and local governments in this country

purchase everything from automobiles to zucchini. Governments could use this purchasing power to support a growing green industry sector within the U.S. economy (Motavalli & Harkinson, 2002). As this suggests, EPP holds great promise as a policy tool for creating a cleaner environment.

Purchasing goods and services in a way that does not harm the environment, however, is no easy task. Deciding how many and what precise characteristics that a product or service must possess to be considered "environmentally preferable" is a complex activity. EPP may refer to the purchase of products that use a lower content of raw or virgin materials in their production. Paper or plastic products, for instance, containing some recycled content would conform to this criterion. Products could also be categorized as environmentally preferable based upon other features such as absence of harmful or toxic chemicals so that they have a low impact on health, air, or water quality. Biodegradable products or those shipped using low volumes of packaging materials so that disposal is facilitated are environmentally friendly. Products manufactured, transported, or used with reduced energy requirements are normally considered appropriate for EPP. EPP might also consider a life-cycle assessment (LCA). LCA is a process for evaluating the environmental impacts tied to a product, process, or activity that captures the entire burden placed on the environment including extracting and processing the raw materials, manufacturing, transport, use, reuse, maintenance, recycling, and final disposition (EPA, 1997). Energy-efficient items and products that conserve water are usually considered environmentally preferable as are lead-free products, ozone-safe products, and those products that put off no volatile organic compounds (VOCs). If services are acquired, EPP considerations might include the commissioning of services from organizations that engage in environmentally sound practices.

EPP must also confront the problem of the conflict between purchasing green or following other dictates of procurement logic. The two most critical of these are performance and cost. Green products must compete on the basis of performance and cost to be in the running for selection. Initially, the criterion of cost was difficult to meet because of a chicken or egg sort of dilemma: Some green products--although not all--tended to be more expensive because they were not yet widely enough demanded to increase volume and drive down their cost. More

recently, greater demand for green products has encouraged more competitive pricing. Another barrier to use may also exist. Even when green products are cost-effective (e.g., park benches made from recycled plastic "lumber" that last for 50 years) their initial costs may be high relative to non-green alternatives and the payback period on initial investment long.

Despite these problems, EPP has emerged as a promising strategy for governments pursuing a cleaner environment. Such pursuits are present at both the national and subnational levels in the United States.

EVOLUTION OF EPP IN THE FEDERAL GOVERNMENT

The Carter Administration ushered in the EPP movement with the passage of the 1976 Resource Conservation and Recovery Act (RCRA). RCRA mandated that all paper purchased by the government contain 30 percent recycled content. It took quite a while for agencies to comply with this requirement but by the end of the Clinton Administration, use of paper with recycled content was widespread (Motavalli & Harkinson, 2002).

Shortly after coming to office in the early 1990s, the Clinton administration began what would become a series of federal efforts to reform government procurement. Beginning with Executive Order (EO) 12873, entitled *Federal Acquisition, Recycling and Waste Prevention*, the federal government turned its attention to EPP (Clinton, 1993).

Executive Order 12873 instructed agencies to consider a variety of factors before planning for, designing, or acquiring any products or services. These factors include the "elimination of virgin material requirements; use of recovered materials; reuse of product; life-cycle cost; recyclability; use of environmentally preferable products; waste prevention…; and ultimate disposal…." (Clinton, 1993, p. 54914). The order instructed agencies to consider these matters for all procurement and in the evaluation of contracts.

EO 12873 extended provisions of Section 6002 of the RCRA which required EPA to create guidelines for procuring agencies so that their procurement practices would maximize energy and resource recovery. Section 6002 of RCRA referred to all procurement agencies but restricted purchasing items to those exceeding $10,000. RCRA required

that those agencies develop an "affirmative procurement program" (or APP), which was to ensure that items composed of recovered materials were purchased to the maximum extent practicable. RCRA established guidelines for paper and paper products, vehicular products, construction products, transportation products, park and recreation products, landscaping products, and non-paper office products (EPA, 2000b). EO 12873 expanded the function of affirmative procurement programs by requiring for all agencies that 100 percent of purchased products meet or exceed the EPA guidelines for resource recovery. Failing this, the procuring agency was required to provide a written justification that such a product was not available at a competitive price or in a timely fashion. EO 12873 also instructed agencies whenever possible to rely on electronic documents, double-sided printed documents, and use of recycled paper. The executive order also instructed agencies to review and revise federal and military specifications and standards to enhance procurement of products made from environmentally preferable or recovered material (Clinton, 1993).

Under EO 12873, agencies were required to report their compliance annually to the Federal Environmental Executive and through that office to the Office of Management and Budget (OMB). To speed the adoption of affirmative procurement programs, EPA was instructed to produce guidance on designated items that are or can be made with recovered materials and on what constitutes an environmentally preferable product. Agencies were also required to set goals for waste reduction, procurement of recycled and environmentally preferable products. EO 12873 specified that all future contractors must comply with the order and that current contacts should be modified to allow compliance where feasible (Clinton, 1993).

Structurally, EO 12873 created the Federal Environmental Executive position within EPA. The role of the Federal Environmental Executive is to encourage improved federal environmental stewardship through the creation of environmental management systems within federal agencies and through the incorporation of environmental concerns in daily operations of federal agencies, and to develop a plan for implementing an "economically efficient federal waste prevention, energy and water efficiency programs, and recycling programs" within each federal agency (Clinton, 1993, p. 54913). To assist the Federal Environmental Executive with responsibilities, four full-time staff persons were drawn

from the Department of Defense (DOD), General Services Administration (GSA) and EPA, and one from other agency.

As called for by EO 12873, on September 29, 1995 the EPA published Proposed Guidance on Acquisition of Environmentally Preferable Products and Services (60 FR 189). This guidance, formally adopted in 1996, suggests seven guiding principles:

- Principle #1 (Pollution Prevention): Consideration of environmental preferability should begin early in the acquisition process.
- Principle #2 (Multiple Attributes): Environmental preferability is a function of multiple attributes.
- Principle #3 (Life-cycle Perspective): Environmental preferability should reflect life-cycle considerations to the extent feasible.
- Principle #4 (Magnitude of Impact): Environmental preferability should consider the scale (global versus local) and temporal aspects (reversibility) of the impacts.
- Principle #5 (Local Conditions): Environmental preferability should be tailored to local conditions where appropriate.
- Principle #6 (Competition): Environmental attributes should be important factors in competition among vendors.
- Principle #7 (Product Attribute Claims): Agencies should examine product attribute claims carefully. (EPA, 1996).

The development of these principles took place over several years. EPA also ran several pilot programs to test the adequacy of these principles. The first of these was the three-year collaborative effort with the General Services Administration (GSA) to identify environmentally preferable cleaning products. The pilot began before the executive order in 1993 with the goal of identifying cleaning products with reduced human health and safety impacts for use in federal buildings. After the issuance of EO 12873, the pilot was modified to test the guidance issued under the executive order (EPA, 1997). The final guidance was published in 1996.

The cleaning products pilot revealed a great number of complexities associated with selection of environmentally preferable products. One of the issues that emerged was whether or not EPA should issue a list of

products that it approved. The cleaning products pilot showed that an "approved products list" was not always the best way to go about selection. The reason for this is that importance of specific attributes can vary based upon local circumstance. In the cleaning products pilot, for instance, it became clear that communities with adequate water treatment plants might be more concerned with air emissions from cleaning products while communities with inadequate water treatment plants might be far more concerned with impacts on water quality from cleaning product use. To accommodate a variety of local priorities, the pilot adopted a compromise approach. Products that met certain threshold levels for lack of toxicity would be identified by a "green dot" on a list of all products. Each product was further described by a product attribute matrix. The matrix allowed assessment of product performance on specific criteria including skin irritation, bio-concentration properties, air pollution potential, content of fragrance or dyes, reduced/recyclable packaging, and minimization of exposure to concentrated product. The matrix allowed users to pick among features that best met their community's needs, while the "green dot" approach provided for ease of selection (EPA, 1997).

The method eventually adopted by GSA in its Commercial Cleaning Supplies catalog incorporates both approaches tested in the pilot. GSA identifies products that meet toxicity and biodegradability standards separately under the heading GSA's Biodegradable Cleaners/Degreasers. Manufacturers of the products provide specific information for the matrix of product attributes. This two-pronged approach allows users to select the product that most effectively meets their needs (EPA, 1997).

In September of 1998, the Clinton Administration strengthened and expanded EO 12873 by issuing EO 13101 entitled, *Greening the Government through Waste Prevention, Recycling, and Federal Acquisition,* requiring that each executive agency incorporate recycling and waste prevention into the daily activities of the agency. Perhaps one of the more important aspects of this executive order was the recognition of the need to expand the market for recycled products to make them cost-effective. This executive order instructed agencies to create a market for such products by becoming a consumer. The order stated:

> It is the national policy to prefer pollution prevention, whenever feasible. Pollution that cannot be prevented should be recycled; pollution that cannot be prevented or recycled should be treated

> in an environmentally safe manner. Disposal should be employed only as a last resort (Clinton, 1998, p. 49643).

All of these activities, however, "must be consistent with the demands of efficiency and cost effectiveness" (Clinton, 1998, p. 49643), which appears at odds with recognition of market forces at work with recycled products.

EO13101 established a Steering Committee on Greening the Government through Waste Prevention and Recycling. The committee was to be composed of the Chair of the Council on Environmental Quality (CEQ), the Federal Environmental Executive, and the Administrator of the Office of Federal Procurement Policy. In addition, the executive order required that every federal government agency designate an Agency Environmental Executive (AEE). Working together the AEEs and the Federal Environmental Executive were directed to produce a Government-wide Waste Prevention and Recycling Strategic Plan and a biennial report to the president on the actions taken by agencies to comply with the order. The Federal Environmental Executive was also instructed to work in coordination with the Office of Federal Procurement Policy, the EPA, the Department of Agriculture (USDA), and GSA to convene a group of procurement managers and state and local governmental environmental managers to work with state and local governments to improve state and local procurement practices. EO 13101 directed EPA to issue final guidance to agencies drawn from the earlier proposed guidance (Clinton, 1998). The guidance was issued in final form in August of 1999.

The final guidance issued took into account several changes in federal purchasing practices put in place between 1995 and 1999. The first was the acquisition streamlining that resulted as a consequence of passage of the National Technology Transfer Act of 1995. That Act required the federal government to utilize industry standards rather than setting separate government standards. The second was the 1997 revision to the Federal Acquisition Regulations that incorporated policies mandating the acquisition of environmentally preferable and energy efficient products and services. These changes to the Federal Acquisition Regulations put in place requirements to include environmental considerations in all aspects of acquisition planning, market surveying, description of agency's needs, evaluation and selection of vendors, and contract administration. The acquisition

streamlining that resulted from reforms initiated in the 1990s included the decentralization of purchasing. No longer were central purchasing offices the only ones with the need to understand the requirements of environmentally preferable purchasing (EPA, 1999).

The proposed guidance issued in 1995 was modified largely as a result of the pilot programs initiated to test its soundness. The changes resulted in the merging of several guiding principles and the addition of one. The final guidance includes five rather than seven principles. A new principle on product safety was added and is now the first principle, made the first principle in large part because of comments regarding the fact that the proposed guidance did not fully enough address traditional purchasing factors. Making this the first principle of the guidance clearly indicated EPA's willingness to balance environmental concerns with traditional purchasing values of safety, price, performance, and availability. Other changes were also made. The proposed guidance principles on life cycle and multiple attributes were combined into one principle. The guiding principles on impacts and local conditions were combined into one to avoid the perception of any conflict between the two. Finally, the proposed principles on competition and product attributes were combined and revised to emphasize the importance of having relative environmental information. The final guidance principles, issued in 1999, read as follows:

- Principle #1 (Environment + Price + Performance = Environmentally Preferable Purchasing): Environmental considerations should become part of normal purchasing practice, consistent with such traditional factors as product safety, price, performance, and availability.
- Principle #2 (Pollution Prevention): Consideration of environmental preferability should begin early in the acquisition process and be rooted in the ethic of pollution prevention, which strives to eliminate or reduce up-front, potential risks to human health and the environment.
- Principle #3 (Life-cycle Perspective/Multiple Attributes): A product’s or service’s environmental preferability is a function of multiple attributes from a life cycle perspective.
- Principle #4 (Comparison of Environmental Impacts): Determining environmental preferability might involve comparing environmental

impacts. Federal agencies should consider the reversibility and geographic scale of the environmental impacts, the degree of difference among competing products or services, and the overriding importance of protecting human health.

- Principle #5 (Environmental Performance Information): Comprehensive, accurate and meaningful information about the environmental performance of products or services is necessary in order to determine environmental preferability. (EPA, 1999, pp. 45816-45825).

Section 503 of EO 13101 encouraged agencies to establish pilot programs to test and evaluate the principles in EPA's guidance. The executive order required agencies to set up demonstration programs to show how they could incorporate environmentally preferable products into their agencies. Agencies were encouraged to draw on the examples set by prior pilots in developing their demonstration projects. The extensive cleaning products pilot (described in some detail above) was followed by a series of other pilots. These included a DOD pilot to apply EPP techniques to the letting of parking lot repair and maintenance contract, an EPA pilot to use green building techniques in the construction of the Ronald Reagan Building and the Research Triangle Park Office Complex, and a DOD pilot using green approaches to the Maintenance of the Pentagon and other DOD facilities (EPA, 1999). Each of these pilots was useful in providing models for agencies to use in establishing their demonstration programs.

In June of 1999, the Clinton Administration issued EO 13123 emphasizing the importance of reducing energy use in the more than 500,000 federal buildings. Efficient energy goals were set by the square foot for federal buildings, and agencies were ordered to reduce their energy consumption by 30 percent by 2005 and by 35 percent by 2010. Section 403 of the order encouraged agencies to meet Energy Start criteria where they were cost effective for energy performance and indoor air pollution standards. The order also mandated the use of Energy Star performance ratings for federal buildings. Agencies were required to evaluate their building's energy performance and to use the rating to plan building updates and maintenance. The Department of Energy's Federal Energy Management Program (FEMP) was assigned the task of working with agencies to insure their compliance (Clinton, 1999).

Late in the Clinton Administration three additional executive orders were implemented, each dealing with some aspect of EPP. EO 13148 sought to improve federal government environmental leadership by ensuring that the head of each federal agency was directly responsible for taking all actions necessary to fully integrate environmental accountability within the agency (Clinton, 2000a). EO 13149 specifically sought to ensure that federal government leadership act to reduce petroleum consumption (Clinton, 2000b) while EO 13150 allowed federal workers to exclude from taxable wages funds spent to commute using mass transit (Clinton, 2000c).

The Bush Administration, as of June of 2003, has issued only one additional executive order regarding EPP. EO 13221 requires executive agencies, when purchasing commercially available off-the-shelf products that use external standby power devices, to ensure that these devices use the lowest possible standby power wattage (Bush, 2001).

The Bush administration has continued the use of the Federal Environmental Executive (originally established by President Clinton's executive order) and appointed John Howard to that role. Howard replaced Fran McPoland, Clinton's appointment. Under both McPoland and Howard, the Office of the Federal Environmental Executive (OFEE) works to promote better environmental stewardship across all agencies in the federal government. In particular, the OFEE coordinates and tracks EPP, waste reduction, and recycling efforts within the executive branch of government. The OFEE works with the OMB and CEQ to promote environmentally sound procurement practices. The OFEE also works with the Department of Agriculture through the Buy Bio program to encourage the use of biomass and other renewable sources.

EPP in U.S. State and Local Governments

The federal government has not acted alone, or necessarily as the leader, in EPP in the U.S. By being at the forefront of EPP development and implementation, it is actually America's subnational governments that have led the way, thus living up to their reputation as "laboratories of democracy" in policy innovation. Table 1 presents aggregate data, gathered by the National Association of State Procurement Officials (NASPO, 2001a), demonstrating the pervasiveness of EPP practices among the states. As the table shows, majorities of states consider environmental and energy-efficiency issues in making awards (69.8

percent), have price preferences for recycled products (86.0 percent), purchase alternative fuel vehicles (90.7 percent), and purchase soybean ink for state printing (65.9 percent). Sizable percentages also procure and use recycled oil (46.5 percent) and require the purchase of reusable items over disposable items (32.6 percent). While these aggregate figures are impressive, they must be tempered by the reality of wide variance in EPP from state to state. For example, although over 90 percent of responding states indicate that they purchase alternative fuel vehicles, such vehicles make up a majority of overall state fleet purchases in only a handful of states (see NASPO, 2001a, pp. 94-96). The same pattern of uneven implementation holds in other areas of EPP such as the number of products the states apply life-cycle costing to, the frequency of EPP, and the size of preferences for environmentally preferable products (see NASPO, 2001a). Still, the data in Table 1 suggest states' widespread general interest in EPP.

This general interest in EPP is, perhaps, better exemplified by a number of subnational governments that initiated path-blazing EPP efforts beginning in the late 1980s and early 1990s. These early "pioneers" (EPA, 2000a) included, among others, the states of Massachusetts and Minnesota, and the local governments of Santa Monica, California; Seattle, Washington; and King County, Washington.

Among the states, Massachusetts has been a bellwether. Under Governor William Weld in 1993, Massachusetts began an aggressive EPP program. From its inception, the state's program has focused on purchasing recycled goods. Today, these purchases include recycled paper and office supplies, plastic lumber benches and tables, recycled motor oil, and recycled traffic cones. Massachusetts also owns 37 zero-emission electric vehicles and 87 natural gas vehicles. The state has adopted eco-friendly standards for cleaning projects and acts to reduce the use of pesticides (Motavalli and Harkinson, 2002). In 2001 alone Massachusetts purchased $68 million worth of products with recycled contents (State of Massachusetts Government, 2002). The state also publishes the *Recycled and Environmentally Preferable Products and Services Guide for Commonwealth of Massachusetts State Contracts*. This guide includes information not only about recycled content products but also about low-toxicity cleaning products, energy efficient lighting, bio-based lubricants, and swimming pool ionization systems that reduce

TABLE 1
Environmentally Preferable Purchasing in the States

Does your state. . .	Number and (%) of States Responding	
	"Yes"	"No"
Use life-cycle costing in determining awards?	32 (76.2%)	10 (23.8%)
Consider environmental or energy-efficiency issues in making awards?	30 (69.8%)	13 (30.2%)
Have a preference for recycled products?	37 (86.0%)	6 (14.0%)
Procure and use recycled oil?	20 (46.5%)	23 (53.5%)
Purchase alternative fuel vehicles?	39 (90.7%)	4 (9.3%)
Purchase soybean ink for state printing?	27 (65.9%)	14 (34.1%)
Require the purchase of reusable items over disposable items, when possible?	14 (32.6%)	29 (67.4%)

Note: Cell entries are the number and percentage of states responding "yes" or "no" to each question.
Source: Adapted from the National Association of State Procurement Officials (2001a), pp. 57-98.

chlorine need substantially (EPA, 2000a). And, since the state's contracts can be used not only by state agencies, but also by municipalities, schools, public colleges and universities, public hospitals, certain nonprofits, and even other states, Massachusetts makes it relatively easy for many government units to identify and purchase environmentally preferable products.

For its part, Minnesota has emphasized offering environmentally preferable products through the state's central purchasing stores. In 1992, for example, the state offered only 122 recycled content items. By 2001, that number had soared to over 2,200 (Minnesota, 2002a). In March 2001, the state signed its first hazardous waste disposal contract for computers and other electronic components (Minnesota, 2002a). As for state vehicles, Minnesota has a large fleet (over 600 vehicles) of "flexible fuel vehicles" powered by E85, a clean-burning blend of 85 percent ethanol and 15 percent gasoline. The state also has an extensive

cooperative purchasing program called the Cooperative Purchasing Venture (CPV). For an annual fee of $350, members of the cooperative can purchase goods and services from the state's contracts. In addition to the cost savings that accrue through contract purchases, cooperative members save time and money by not having to develop their own (thus, redundant) environmentally preferable product specifications. As of December 2000, 446 public entities are participating in Minnesota's program (State of Minnesota Government, 2000).

Local governments also have been EPP leaders in the U.S. King County, Washington, an early adopter of EPP, stands as a perfect example. King County began its environmentally preferable purchasing program in 1989. Initially, the program encouraged agencies to buy recycled content goods "whenever practicable." In 1995, the policy was expanded beyond recycled content products to include other environmentally preferable materials and processes (King County, 2002). Today, the county's green purchases include not only recycled paper (which accounts for over 97 percent of the county's paper purchases), but also remanufactured toner cartridges, re-refined antifreeze and motor oil (both of which are used by all county fleets, including 1200 buses), retread tires, and plastic lumber. The county also purchases energy efficient lighting and low-toxicity cleaning products, and has developed a green building program. Combined, the county estimates that it purchased $4 million in environmentally preferable products in 2002 alone, *saving* over half a million dollars in doing so. Importantly, the savings accrued to the county through EPP demonstrate that the approach *can* produce savings in both the short term (in initial cost savings) and long term (over the life cycle of the good or product).

Finally, the City of Santa Monica, California, stands as another particularly effective model of local government EPP. The city council voted in 1994 to become a "sustainable city" and has not looked back. The city has replaced toxic cleaning products with safe alternatives and in the process reduced its spending on these products by five percent (EPA, 1998). The city estimates that implementing the safe cleaning products program eliminated approximately 3,200 pounds of hazardous products purchased annually. The city has converted 75 percent of its 500-vehicle fleet to alternative fuels, and it uses recycled motor oil and less toxic antifreeze in those vehicles. The city is also involved in efforts to change procurement practices themselves by replacing the lowest

price purchasing model with one that looks at life-cycle costs and factors them into the purchasing equation (Motavalli and Harkinson, 2002) and by developing pass/fail standards for environmentally preferable cleaning products.

These examples are, of course, only a sampling of government EPP efforts underway at the subnational level. North Carolina's "Sustainable North Carolina," Vermont's "Clean State," and California's "State Agency Buy Recycled Campaign" are examples of other leading state EPP initiatives. At the local level, Seattle, Washington, San Diego, California, and more recently Phoenix, Arizona, each have implemented noteworthy EPP programs (see EPA, 2000a). Together, these efforts attest to the diffusion of EPP as a policy tool for environmental sustainability.

ADOPTING AND IMPLEMENTING EPP

Given the success of EPP in a number of government settings and its potential as an effective tool for environmental sustainability, questions naturally arise over how to establish and effectively implement an EPP program.

EPP Policies: Mandatory versus Voluntary

In practice, EPP programs fall into two categories: mandatory and voluntary. Mandatory efforts *require* environmentally preferable purchasing. Depending on the level of government involved, a mandatory program may come in the form of a state or federal statute, local ordinance, executive order, or administrative rule. Voluntary efforts, on the other hand, range from individual purchasing agents exercising their discretion to buy green products, to more formal policy directives encouraging—but not requiring—EPP. Opinion is split as to which approach is more efficacious. On the one hand, unless EPP is mandated, those with purchasing authority may not feel that they "have to" purchase green and, therefore, simply will not do so. This would suggest the importance of formally mandated EPP requirements. On the other hand, some of the most successful EPP programs are found in governments that have adopted voluntary policies (EPA, 2000a).

Whether mandatory or voluntary, governments wishing to pursue environmental sustainability through procurement should adopt an EPP

policy or amend their existing procurement policy to incorporate green language. There are several advantages to adopting a specific EPP policy, including generating greater momentum for the effort and sending strong signals to government personnel and potential vendors that the jurisdiction is serious about making EPP a part of its routine administrative practices (EPA, 2001). Several pioneers mentioned in the previous section (e.g., Minnesota, King County) offer model EPP policies on their websites. These model policies can serve as general guides to jurisdictions looking to adopt their own EPP policies.[1]

Integrating EPP

As is the case with all public policies and programs, the success or failure of EPP is determined by implementation. At the most basic level, successful EPP requires active commitment from policy leaders, strong advocates, and integration within a jurisdiction's overall management system. Visible support from high-level officials—which, depending on level of government, might include city council, city manager, governor, legislators, agency directors, etc.—provides the stamp of legitimacy to EPP thus increasing its likelihood of success (EPA, 1998; NASPO, 2001b). Similarly, an advocate can serve as an effective champion of the program thus creating useful momentum and enthusiasm for implementation (EPA, 2000a).

Assuming the program has legitimacy and active support, governments can further increase the chances of success for their EPP efforts by taking steps to align EPP with broader governmental objectives.[2] For example, in a study of both public and private sector EPP programs, New, Green, and Morton (2002) found the most successful effort belonged to a local government that integrated its EPP program into overall missions regarding environmental protection and economic development. The researchers contend that this integration gave the program a measure of validation as a worthy pursuit because of its association with broader government objectives. While environmental sustainability is certainly an appropriate broad government objective (e.g., Santa Monica's "Sustainable City"), it might be that "improving quality of life" represents an even broader (hence, potentially better) objective for framing EPP. Since governments have elevated quality of life to the top of their agendas in recent years (Barrett and Greene, 2000), such an approach could be used to tie EPP into

existing momentum. Regardless, the point is that aligning EPP with overarching and widely supported objectives can help ensure its success.

STRATEGIES FOR EPP IMPLEMENTATION

Operationally, a number of specific strategies exist for implementing EPP. These strategies include setting price preferences for recycled content and other environmentally preferable products or services, developing environmentally preferable product and service specifications, using "best value" and life-cycle cost criteria, setting specific goals for levels of EPP to be achieved, raising awareness about EPP through vendors fairs, training, and educational outreach, establishing project-based "green teams," and developing and adopting cooperative purchasing. Each of these strategies will be considered briefly.

Price Preferences

When governments initially created EPP programs in the late 1980s and early 1990s, the most popular policy approach was to adopt purchasing preferences favoring environmentally preferable products. A typical policy would allow the purchasing agent to select a bidder offering an environmentally preferable product or service as long as the product or service met the performance requirements announced in the bid specifications and as long as the price was within a certain percentage (e.g., 5, 10, or even 15 percent) over that of its non-green counterparts. The rationale behind price preferences was simple: initially, environmentally preferable products were more expensive due to limited suppliers and limited production, so paying a small increment more for these products to meet EPP objectives made sense (EPA, 2001). As mentioned above, Table 1 demonstrates the pervasiveness of this approach at the state level.

More recently, cost-conscious observers have begun to question unanticipated effects price preferences may have on vendor behavior. Specifically, some question if vendors' knowledge about the availability of price preferences induces them to offer their environmentally preferable products at inflated prices (Raymond, 1997). As the EPA (2000a, 13) notes, "Sellers of environmentally preferable products could be very price competitive, theoretically, but might lack any incentive

because they can earn more as long as price preferences exist." Given such concerns, governments may find it advantageous to pursue a second EPP strategy: including specific environmentally preferable language such as "recycled only" requirements in procurement specifications.

Green Specifications

Specifications describe the good or service being sought by government (e.g., general product or service descriptions, the number of units needed, the purpose to be served by the product or service) and indicate any standards or requirements that the product or service must meet (e.g., performance characteristics, materials composition, appearance and finishes, etc.). To incorporate environmentally preferable language into procurement policies and specifications, governments need to do two things. First, governments need to review existing contracts and product and service specifications to ensure that green products and services are not precluded. For example, if a government has solicited bids for printing and photocopying paper and specified "virgin paper" (i.e., paper containing no recycled content) in its bid announcement, that would, by definition, exclude recycled-content paper. Such language should be removed so as to eliminate barriers to procuring environmentally preferable goods.

Second, governments need to add language to their procurement polices and specifications that encourages vendors to offer environmentally preferable products. Continuing with the paper example, if a government unit wanted to consider recycled content paper and virgin paper, it might specify that virgin and recycled content paper would be considered but that a price preference would be given to bids offering recycled content paper. For reasons mentioned above, however, a better approach might be to include language in the specifications *requiring*, say, "50 percent recycled content paper." Here, only bidders offering the environmentally preferable product would be considered. Here, the cost and performance of the virgin paper is immaterial, as the government's procurement need for a recycled product has been clearly specified. This general "make it clear" logic is captured by an official form King County, Washington:

> If the price and performance of low-toxicity cleaning products meets your needs, then the price of the traditional cleaning product is irrelevant. You're not trying to buy a traditional

> cleaning product. You're trying to buy low toxicity. If you want to buy oranges, it doesn't matter how expensive apples are (EPA 2000a, p. 13).

As this suggests, language can easily be included in specifications requiring certain energy-efficiency standards, minimum recycled content requirements, toxic-free materials, or other environmentally preferable characteristics. Detailed guidance on writing environmentally preferable specifications is available from a number of sources.[3]

"Best Value" Approach and Life-Cycle Costs

When it comes to evaluating bids, the traditional procurement approach is to award a contract to the "lowest responsible bidder." In other words, the vendor submitting the lowest priced bid that meets stated specifications is awarded the contract. The "best value" approach, in comparison, expands the number of factors considered in evaluating a product or service. For example, a purchaser employing the best value approach might consider the actual performance of a product or service provider (e.g., during a required testing phase), the maintenance and operating costs of a product, and the environmental impacts of the good or service over its life cycle. Considering products' life-cycle costs is an approach that has generated particular interest among EPP proponents. As mentioned above, such a life-cycle assessment might include not only the initial acquisition costs but also the costs of extracting the raw materials used in producing the product, the costs of producing a product, of associated packaging and transporting the product, of operating and maintaining the product over its functional lifespan, and of disposing of or recycling the product. The idea here is simple: a non-green product may have a lower upfront cost, but the cost of the good over its full life cycle may be much higher in comparison to an environmentally preferable alternative. When this is the case, government officials have a sound basis for purchasing environmentally preferable products. EPA funded an effort by the National Institute of Standards and Technology (NIST) to develop a tool to help governments make life cycle-based decisions.[4]

Setting EPP Goals

A fourth strategy for successful EPP implementation is adopting annual goals for environmentally preferable purchases.[5] Conceivably,

the goal-setting approach could work with price preferences, green-only specifications, best value analyses, or any other EPP strategy. That is to say that specific EPP goals can be articulated and the means to their achievement can vary according to what a particular government's procurement practices and capacity allow. As for the scope of the goals, experience suggests that governments may want to start small with, for example, a recycled content program, then gradually expand environmental preferences to other products and service areas. This goal-focused approach was utilized successfully by both the State of Massachusetts and the City Santa Monica, California (EPA, 2001). Finally, EPP goals are more likely to be met if they are measurable, include clear timetables for attainment, are periodically reviewed, and agencies are held accountable for their performance (NASPO, 2001b).

EPP goals are required at the federal level where agencies must submit specific goals as part of their affirmative procurement plans (APP). The little evidence that exists for other levels of government suggests that governments have not fully embraced the goal setting approach. Specifically, a recent survey by the National Institute of Governmental Purchasing (NIGP, 2001) found that only 5.4 percent of respondents reported that their agencies set EPP goals for 2000, only 6.0 percent did so in 2001, and only 6.5 percent planned to do so for 2002. Despite this lackluster evidence, setting goals represents a recommended strategy for assuring EPP success (White House Task Force, 2001; NASPO, 2001b).

Raising Awareness about EPP

EPP efforts suffer if end-users and purchasers are unaware of a government's preference for environmentally preferable products and services or if they are unfamiliar with or misinformed about available green products and services that could meet their procurement needs. To overcome this, governments may pursue efforts to raise awareness of EPP programs, products, and services and the benefits of buying green. Two specific examples of this are vendor fairs and training and educational outreach programs. Vendor fairs provide a forum for bringing together vendors of various green products and services and government purchasers. This allows purchasers to see firsthand the products and services that are available and provides the opportunity to ask vendors directly about the performance, price, and availability of

their products and services. Vendors Fairs have been used successfully by the likes of Santa Monica, California (EPA, 1998); Kansas City, Kansas; Portland, Oregon; and Massachusetts (EPA 2001).

A second awareness-raising strategy is to offer training and educational outreach to government purchasers and end-users. Such efforts might involve staff from the central procurement agency or an environmental purchasing project team (if such a team exits) educating purchasers and end-users on the availability and benefits of environmentally preferable products and services. It might also include offering technical training to purchasers on how to use existing procurement processes (e.g., state contracts, central supply stores, requests for bids) to purchase green products and services. A good example of a government doing these sorts of things is the state of Minnesota. The state's Materials Management Division (MMD) offers extensive training on environmental purchasing as a segment of its required state purchasing certification classes. The training focuses on helping purchasers request and review environmental considerations in their bids and proposals. Also, the state's Resource Recovery Office has prepared environmental purchasing information that is included in a purchasing training notebook provided by MMD to all state purchasers. The state of Connecticut takes a slightly different tact, focusing its training on end-users (as opposed to purchasers) in an attempt to create demand for environmentally preferable products (EAP 2001). Generally, these awareness-raising efforts can go a long way toward dispelling misconceptions about the performance and availability of green products and services and can generate momentum for EPP.

Establishing "Green Teams"

A team-based approach to EPP recognizes the benefits of cross-functional teams whose members possess different perspectives and insights about government's purchasing needs and constraints (NASPO, 2001b). Ideally, these teams would include purchasers, end-users, staff from the central procurement agency, and individuals with environmental expertise (EPA, 2001). These so-called "green teams" may be responsible for a variety of tasks, including formulating a EPP policy, reviewing purchasing practices and tendencies to identify areas where environmentally preferable products could have an impact,

formulating EPP goals, publicizing the EPP program, and monitoring progress.

One variant of the team-based approach is to organize commodity teams that focus on specific product or service areas. An excellent example of the commodity team approach comes from the City of Seattle, Washington. The city's "Copernicus Project" consists of 18 separate commodity teams, including teams for building materials, printing, communication equipment, furniture, hazardous materials, and janitorial supplies, to name just a few (Seattle, 2001). In each instance, the commodity teams seek ways to improve the efficiency and effectiveness of procurement in their respective commodity areas while simultaneously incorporating environmentally preferable benefits. The city's efforts have not gone unnoticed in the professional procurement community: In 2000, the Copernicus Project received the "Best Practices in Public Procurement Award" from NIGP.

Cooperative EPP Efforts

The final strategy to be considered here is cooperative EPP. The cooperative approach applies to the development of EPP programs and to the actual purchase goods and services. Excellent illustrations of the former are collaborative efforts for developing specifications and standards for environmentally preferable products. Developing these specifications is difficult, time-consuming, and expensive and costs are multiplied when governments replicate the work of other governments. Cooperative approaches avoid this replication by bringing together several governments to develop and adopt uniform standards and specifications. In one such effort, Massachusetts, Minnesota, King County, Santa Monica, and several other governments developed a national standard for environmentally friendly cleaning products (Case, 2002). In another case, the Coalition of Northeastern Governors' (CONEG) Source Reduction Task Force developed model specifications for six separate compost products (Farrell, 1996). In both of these cases, the goal was to create consensus criteria for environmentally preferably products so as to encourage vendors to invest in and market green products acceptable to a large number of government purchasers.

The second form of cooperative EPP focuses on purchasing. The strategy, in a nutshell, is for public agencies to combine their purchasing power through cooperative purchasing arrangement. The benefits of

these arrangements include lowering unit costs, lowering administrative costs, increasing the volume of green products and services purchased, and establishing common standards and specifications for vendors to follow (White House Task Force, 2001). Minnesota's Cooperative Purchasing Venture (CPV) is illustrative. As mentioned above, the CPV allows public entity members to purchase goods and services from the state's contracts. The state estimates that members may be able to enjoy cost savings as high as 75 percent, plus members have access to over 2,200 environmentally preferable products. And, since the state devised the green product specifications, solicited the bids, and awarded the contracts, CPV members save additional time and resources. Vendors of green products likewise benefit as their products are required to meet only one set of specifications but are then acceptable to hundreds of public entities. Obviously, cooperative strategies have much to offer EPP.

CONCLUSION: PROSPECTS FOR EPP

As is the case with every government policy or program, EPP faces a number of challenges to successful implementation. Given the partisan dynamics that impinge upon public policy, EPP will always face political challenges. In certain political circles, the mere word "green" can conjure up images of environmental extremism. In the case of EPP, such images would seem to be unwarranted. Indeed, there is some evidence that EPP has become a bipartisan commitment in the U.S. (Bergeson, 2002). Still, some elected officials, hence their administrations, will be more "environmentally friendly" relative to others. For example, Santa Monica's high-profile EPP program hinges in part on a liberal interpretation of the "lowest responsible bidder" clause: The Environmental Programs Division uses the "responsible bidder" language as a gateway to considering environmental criteria. For some time now the city council has accepted this broad interpretation, but that does not mean it will always be the case (EPA, 1998). Even where EPP is explicitly mandated, implementation can be affected by the priorities and enthusiasm of the administration: if an administration places a low priority on EPP and does not enthusiastically endorse it, then implementation will be uneven at best. The challenge for EPP proponents is to garner the support of political leaders, which often requires educating them on the benefits of EPP and the costs—both

pecuniary and environmental—of doing nothing. Still, the vagaries of the political system will always have an effect on the success of government EPP.

Of course politics is not the only challenge to EPP: A number of practical challenges must also be addressed. For example, in the aforementioned NIGP survey (NIGP, 2001), respondents were asked to "indicate any challenges/barriers that have limited your efforts in purchasing green goods and/or services." The items indicated most often were inadequate awareness (46.1 percent), conflicting priorities (44.0 percent), decentralization of decision making/purchasing (37.6 percent), and inadequate guidance (35.5 percent). Findings like these suggest the importance of raising the awareness of EPP and its benefits among purchasers and end-users and clarifying the priorities and values to be achieved through public procurement.

To be successful the practical problems of raising awareness of EPP and its benefits and correcting misinformation and misconceptions must be addressed. These challenges have not gone unnoticed. The White House Task Force on Recycling (2001, 5), for example, recently identified several common EPP myths and offered responses that attempted to debunk them:

- Myth #1 (Performance): The first myth is that recycled products are inferior. Most recycled products meet the same technical and quality specifications as their virgin material counterparts and may actually provide superior characteristics.
- Myth #2 (Price): It is mythical that recycled products cost more. At one time, before there were ample numbers of suppliers and products, recycled items may have cost more. Today, however, recycled-content products are likely to be competitively priced and, in some cases (e.g., paper), may actually be cheaper than their virgin counterparts.
- Myth #3 (Availability): The third myth is that recycled products are not readily available. American industry has responded to government and industry demand for recycled products. More and more products are being made available in greater quantities every day.

Importantly, myths like these do not exist solely in the minds of end-users and casual observers. Indeed, EPP must work to overcome skepticism *within* the public procurement community. For example, NASPO still pejoratively refers to environmentally preferable purchasing policies as one of several "restraints on competition" (NASPO, 2001b, p. 20). Their position on environmentally preferable purchasing and other procurement preferences (e.g., in-state, minority-owned, or small business preferences) aimed at achieving socioeconomic goals is clear: "Despite nearly two decades of experience with these programs, there is no substantial body of data to indicate whether their often laudable goals are being met and, thus, worth the cost of government of maintaining them, included losses due to restricted competition" (NASPO, 2001b, p. 21).

Debunking myths, ameliorating skepticism, and raising awareness requires vigilance on the part of agencies and green product users to tout the successes they enjoy through their EPP programs. One obvious approach is to produce and publicize EPP success stories. Fortunately, there is a growing body of evidence (though largely anecdotal) suggesting that EPP can provide products and services government needs and that it can actually save money in both the short term (through lower product costs, such as with recycled paper) and the long term (through lower life-cycle costs). Federal agencies are required by EO 13101 to promote their programs, both internally and externally, so as to spread the word about EPP's benefits and successes. Strategies mentioned above, like vendor fairs and educational outreach, also hold promise for raising awareness about EPP.

Conflicting procurement priorities and values also present a challenge to successful EPP adoption and implementation. In making procurement decisions, policy makers and procurement officials often struggle to balance traditional "procurement goals" (e.g., efficiency, economy, performance, fairness) and "non-procurement goals" (e.g., environmental preferences) (see Thai, 2001, p. 27). The challenge can be daunting:

> . . [P]urchasing agents are increasingly called upon to balance the dynamic tension between competing socioeconomic objectives, provide a consistence [sic] agency face to suppliers of goods and services, satisfy the requirements of fairness, equity and transparency, and at the same time, maintain an overarching

> focus on maximizing competition while maintaining economy and efficiency" (McCue & Gianakis, 2001, pp. 72-3).

Unfortunately, there are no easy answers to this challenge. The appropriate weight afforded environmental factors relative to other procurement factors will depend upon jurisdictions' priorities and political climate. Ideally, procurement officials could show that attaining EPP goals does not necessarily detract from attaining traditional procurement goals. For example, using life-cycle cost assessments, it may be possible to show that environmentally preferable products and/or services not only accomplish environmental goals, but also effectively meet government's procurement needs while maximizing economy, especially over the long run. Some help also may be provided in this regard as governments and third-party nonprofits like Green Seal develop product standards and specifications and technical tools that clarify the tradeoffs associated between green and traditional products. Green Seal, for example, has initiated a "Greening Your Government Program" that includes specific recommendations on environmentally preferable products based upon performance criteria and life-cycle assessments. Another tool, developed jointly by the White House Task Force on Recycling, the U.S. Postal Service, EPA, and Environmental Defense, is the "Paper Calculator." The calculator allows users to compare the life-cycle environmental impacts of paper made with different levels of post-consumer recycled content.[6] Yet another tool, as mentioned previously, is NIST's "BEES" software for determining life-cycle costs of various products. Finally, the EPA has developed several cleaning product "decision wizards" which are designed to help users select environmentally preferable products based upon attributes selected and weighted by the user.[7]

When combined with clearer guidance by procurement officials and policy makers on the values to be maximized in procurement decisions, the continued development of decision making tools holds promise for meeting the challenge of multiple and, at times, conflicting procurement priorities. Perhaps these efforts will allow EPP to becoming more fully integrated into government's procurement function. If so, then Eun-Sook Goidel's observation as director of the EPA's EPP program may prove to be prescient: "In five to 10 years this whole concept [EPP] will become yet another part of what people do on an everyday basis as part of their decision making process" (as quoted in Maxwell, 1997, p. 40).

In other words, the distinction between "traditional procurement" and "EPP" could one day disappear.

NOTES

1. For example, see King County's model policy at: www.metrokc.gov/procure/green/mdpolicy.htm (Accessed July 16, 2003).
2. It is worth noting that Section 6002 of RCRA and EO 13101 attempt to incorporate environmental concerns into federal agency procurement planning and management by requiring agencies to prepare Affirmative Procurement Plans (APP). The White House Task Force on Recycling has created a model APP that can be downloaded from the Office of the Federal Environmental Executive at: www.ofee.gov/eo/app.pdf. (Accessed July 16, 2003).
3. One good example is the State of Minnesota's (2002b) publication, *The Environmentally Preferable Purchasing Guide*, which recommends several ways to put environmental attributes "in writing."
4. Free software for the NIST's decision-enabling tool, Building for Economic and Environmental Sustainability (or "BEES" for short), is available for free download at the EPA's website (see www.epa.gov/oppt/epp/tools/bees.htm (Accessed on July 22, 2003).
5. A related approach to goal setting is the use of EPP set-asides. Set-asides require that a certain percentage of a government's purchases be environmentally preferable. For example, a government might adopt a policy that 50 percent of all paper products purchased annually contain at least 30 percent recycled content.
6. The paper calculator can be accessed at the OFEE's website: www.ofee.gov/recycled/calculat.htm (Accessed July 18, 2003).
7. The EPA decision wizards are available at: www.epa.gov/opptintr/epp/cleaners/select/matrix.htm (Accessed July 18, 2003).

REFERENCES

Barrett, K., & Greene, R. (2000). "The Government Performance Project. Grading the Cities: A Management Report Card." *Governing*, *13* (5): 22-24.

Bergeson, L. L. (2002). "Green Buy Programs: An Important Procurement Factor." *Pollution Engineering*, *34* (5): 30-32.

Bush, G. W. (2001, August 2). "Executive Order 13221, Energy Efficient Standby Power Devices." *Federal Register*, *66* (149): 40571.

Case, S. (2002, October). "Environmentally Preferable Purchasing—Moving Beyond "Buy Recycled." *Government Procurement*: 8-12.

Clinton, W.J. (1993, October 22). "Executive Order 12873: Federal Acquisition, Recycling and Waste Prevention." *Federal Register*, *58* (203): 54911-54919.

Clinton, W. J. (1998, September 16). "Executive Order 13101, Greening the Government through Waste Prevention, Recycling, and Federal Acquisition." *Federal Register*, *63* (179): 49643-49651.

Clinton, W.J. (1999, June 8). "Executive Order 13123, Greening the Government through Efficient Energy Management." *Federal Register*, *64* (109): 30851-30860.

Clinton, W.J. (2000a, April 26). "Executive Order 13148, Greening the Government through Leadership in Environmental Management." *Federal Register*, *65* (81): 24595-24606.

Clinton, W.J. (2000b, April 26). "Executive Order 13149, Greening the Government through Federal Fleet and Transportation Efficiency." *Federal Register*, *65* (81): 24607-24611.

Clinton, W.J. (2000c, April 26). "Executive Order 13150, Federal Workforce Transportation." *Federal Register*, *65* (81): 24613-24614.

Cooper, P. (2003). *Governing by Contract: Challenges and Opportunities for Public Managers.* Washington, DC: CQ Press.

Environmental Protection Agency. (1996). *Summary of Comments at the Public Meeting on Proposed Guidance on Acquisition of Environmentally Preferable Products and Services* (EPA742-R-96-005). Washington, DC: Author.

Environmental Protection Agency. (1997). *Environmentally Preferable Purchasing Program: Cleaning Products Pilot Project* (EPA742-R-97-002). Washington, DC: Author.

Environmental Protection Agency. (1998). *The City of Santa Monica's Environmental Purchasing: A Case Study* (EPA742-R-98-001). Washington, DC: Author.

Environmental Protection Agency. (1999, August 20). "Final Guidance on Environmentally Preferable Purchasing for Executive Agencies." *Federal Register*, *64* (161): 45810-45857.

Environmental Protection Agency. (2000a). *State and Local Government Pioneers: How State and Local Governments Are Implementing Environmentally Preferable Purchasing Programs* (EPA742-R-00-004). Washington, DC: Author.

Environmental Protection Agency. (2000b). *RCRA, Superfund & EPCRA Hotline Training Module: RCRA Statutory Overview* (EPA530-R-99-063 PB2000-101 903). Washington, DC: Author.

Environmental Protection Agency. (2001). *Waste Wise Update: Environmentally Preferable Purchasing* (EPA530-N-01-002). Washington, DC: Author.

Farrell, M. (1996). "Source Separated Procurement Specifications." *BioCycle*, *37* (12): 48-49.

General Accounting Office. (2003a). *Federal Procurement: Spending and Workforce Trends* (GAO-03-443). Washington, DC: Author.

General Accounting Office. (2003b). *Contract Management: Comments on Proposed Services Acquisition Reform Act* (GAO-03-716T). Washington, DC: Author.

King County, Washington. (2002). *Environmental Purchasing Program 2002 Annual Report*. Seattle, WA: King County Environmental Purchasing Program.

Maxwell, A. (1997). "Green Government: The Move Toward Environmentally Friendly Federal Purchasing Practices Is Blossoming." *Government Executive*, *29* (10): 37-40.

McCue, C.P., & Gianakis, G.A. (2001). "Public Purchasing: Who's Minding the Store?" *Journal of Public Procurement*, *1* (1): 71-95.

Minnesota Department of Administration. (2000). *State Resource Recovery Program, Fiscal Years 1999-2000*. St. Paul, MN: Author.

Minnesota Department of Administration, Materials Management Division. (2002a). *Green Government—What Is the State of Minnesota Doing, and What More Should Be Done*? St. Paul, MN: [On-line]. Available: www.mmd.admin.state.mn.us/pdf/MNGreen GovernmentActions.pdf. (Accessed July 18, 2003).

Minnesota Solid Waste Management Coordinating Board. (2002b). *The Environmentally Preferable Purchasing Guide.* St. Paul, MN: [On-line]. Available: www.swmcb.org/eppg/default.asp. (Accessed July 16, 2003).

Motavalli, J., & Harkinson, J. (2002). "Buying Green: Harnessing the Incredible Procurement Power of Governments, Hospitals, Colleges and America's Biggest Corporations to Protect the Environment." *E/The Environmental Magazine*, *13* (5): 26-33.

National Association of State Procurement Officials (NASPO). (2001a). *2001 Survey of State and Local Government Purchasing Practices*. Lexington, KY: Author.

National Association of State Procurement Officials (NASPO). (2001b). *State and Local Government Purchasing Principles & Practices.* Lexington, KY: Author.

National Institute of Governmental Purchasing (NIGP). (2001). *NIGP Survey of Green Procurement Initiatives.* Herndon, VA: NIGP.

National Science and Technology Council. (1995, April). *Bridge to a Sustainable Future: National Environmental Technology Strategy.* Washington, DC: U.S. Government Printing Office.

New, S., Green, K., & Morton, B. (2002). "An Analysis of Private versus Public Sector Responses to the Environmental Challenges of the Supply Chain." *Journal of Public Procurement*, *2* (1): 93-105.

Raymond, M. (1997). "It's Not Easy Buying Green." *Governing*, *10* (11), 49-50.

Rosenbaum, W.A. (2002). *Environmental Politics and Policy* (5th ed.) Washington, DC: CQ Press.

Seattle, City of. (2001). *Purchasing Services Division, Annual Report 2001*. Seattle, WA: Purchasing Services Division. Seattle, WA: Purchasing Services Division [On-line]. Available:

www.cityofseattle.net/purchasing/docs/2001psdreport.pdf (Accessed July 16, 2003).

State of Massachusetts Government. (2002). *How to Do Business with the Commonwealth of Massachusetts: A Guide for Manufacturers and Suppliers of Environmentally Preferable Products*. Boston, MA: The Chelsea Center for Recycling and Economic Development and the Commonwealth of Massachusetts Operational Services Division.

Thai, K. V. (2001). "Public Procurement Re-Examined," *Journal of Public Procurement*, *1* (1): 9-50.

White House Task Force on Recycling. (2001). *Greening the Government: A Guide to Implementing Executive Order 13101*. Washington, DC: Author. [On-line]. Available: www.ofee.gov/eo/greening.pdf (Accessed July 16, 2003).